GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

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NARRATIVE

TO: Heather Brown

FROM: Anna Gray

DATE: February 8, 2023

Facility Name:	Nexus Circular LLC (previously known as Nexus Headquarters)
AIRS No.:	121-00946
Location:	Atlanta, Georgia (Fulton County)
Application #:	28615
Date of Application:	September 28, 2022

Background Information

The Nexus Headquarters facility is located at 500 Waterfront Drive, SW, Atlanta, Georgia 30336.

The facility is currently a synthetic minor (SM) facility. They have a 10/25 tpy limit for HAP emissions due to hydrogen chloride (HCl) emissions from two Extruders (Source Code EX01 and EX02). The facility is located in Atlanta, Fulton County and currently operates under Air Quality Permit 2869-121-0946-S-01-0 issued on August 4, 2017. The facility processes post-consumer and post-industrial thermoplastics by pyrolysis producing petroleum-based liquid, solid, and gaseous products. Equipment at the facility consists of conveyors, a shredder, extruders, pyrolysis reactors, sludge processing units, a condenser, storage tanks and associated control equipment. Process vapors produced by the pyrolysis reactors and the sludge units will be captured and condensed into liquid products for sale. Uncondensed process vapors will be recirculated and combusted in the pyrolysis reactor burners as a gaseous fuel. HCl emissions from the Extruders (Source Code EX01 and EX02) are controlled by the Extruder Scrubber (Source Code SC01). A flare is continuously on standby in case of upset, malfunction and for periods when the pyrolysis reactor burner(s) cannot fully consume the uncondensed process vapors. Application No. 24218 was received March 20, 2017 for the initial construction and operation of the facility.

Purpose of Application

Nexus has submitted Application No. 28615 dated September 28, 2022, to the Division for review. The public advisory comment period ended on December 9, 2022. No comments were received.

The purpose of the application is to add a new production line similar to the existing production line at the facility. The new line will be located adjacent to the first production line. No modifications to the existing production line are proposed as part of this application.

The proposed new line will consist of: (2) shredders, (2) extruders, (2) scrubbers, (3) pyrolysis reactors, (3) dryers, (1) flare, (2) internal combustion (IC) process gas-fired generators for internal power generation, (8) crude oil storage tanks, (4) wax storage tanks, (1) emergency generator, (1) truck loadout, and (1) rail loadout.

To clearly define the potential to emit of the facility, Nexus requests limits of 24.9 tons per year VOC and 24.9 tons per year NOx to be added to the facility's permit. Additionally, Nexus Headquarters is submitting a Name Change form to change its name to Nexus Circular LLC.

Updated Equipment List

Emission Units			Associated Control Devices	
Source Code	**Description**	**Installation Date**	**Source Code**	**Description**
EX01	Extruder 1	2017	SC01	Extruder Scrubber 1
EX02	Extruder 2	2017	SC01	Extruder Scrubber 1
EX03	Extruder 3	2023	SC02	Extruder Scrubber 2
EX04	Extruder 4	2023	SC03	Extruder Scrubber 3
*PB01	Pyrolysis Reactor 01	2017		
*PB02	Pyrolysis Reactor 02	2017		
*PB03	Pyrolysis Reactor 03	2017		
PB04	Pyrolysis Reactor 04	2023		
PB05	Pyrolysis Reactor 05	2023		
PB06	Pyrolysis Reactor 06	2023		
*SB01	Sludge Unit 01	2017		
*SB02	Sludge Unit 02	2017		
*SB03	Sludge Unit 03	2017		

*Exempt per Rules 391-3-1-.03(6)(i)1 and 2.

Storage Tanks

Unit ID	Name	Installation Date	Description
*ST01	Storage Tank 1	2017	Crude Oil Tank-Capacity 21,000 Gallons
*ST02	Storage Tank 2	2017	Crude Oil Tank-Capacity 21,000 Gallons
*ST03	Storage Tank 3	2017	Crude Oil Tank-Capacity 21,000 Gallons
*ST04	Storage Tank 4	2017	Crude Oil Tank-Capacity 16,800 Gallons
ST05	Storage Tank 5-T1300	2023	Oil storage tank- Capacity 12,000 Gallons
ST06	Storage Tank 6-T1305	2023	Oil storage tank- Capacity 12,000 Gallons
ST07	Storage Tank7-T1310	2023	Oil storage tank- Capacity 12,000 Gallons
ST08	Storage Tank 8-T1315	2023	Oil storage tank- Capacity 12,000 Gallons
ST09	Storage Tank 9-T1320	2023	Oil storage tank- Capacity 12,000 Gallons
ST10	Storage Tank10-T1325	2023	Oil storage tank- Capacity 12,000 Gallons
ST11	Storage Tank 11-T1330	2023	Oil storage tank- Capacity 12,000 Gallons

ST12	Storage Tank 12-T1335	2023	Oil storage tank- Capacity 12,000 Gallons
**ST13	Storage Tank 13-T1340	2023	Wax storage tank- Capacity 17,000 Gallons
**ST14	Storage Tank 14-T1345	2023	Wax storage tank- Capacity 17,000 Gallons
**ST15	Storage Tank 15-T1350	2023	Wax storage tank- Capacity 17,000 Gallons
**ST16	Storage Cistern 16-T1355	2023	Wax storage tank- Capacity 17,000 Gallons

* Exempt per Rule 391-3-1-.03(6)(c)2
**Exempt per Rule 391-3-1-.03(6)(c)1

Fuel Burning Equipment

Source Code	Capacity	Description	Installation Date	Construction Date
IC01	250 KW	Internal Combustion Engine	2023	2022
IC02	250 KW	Internal Combustion Engine	2023	2022
*FB01	<5 MMBtu/hr	Flare	2017	2017
*FB02	<5 MMBtu/hr	Flare	2023	2022
**EG01	500 HP	Emergency Generator	2023	2022

* Exempt per Rule 391-3-1-.03(6)(b)1
** Exempt per Rule 391-3-1-.03(6)(b)11(i)

Emissions Summary

The facility used engineering calculations to determine the emissions from each new process and updated the calculations for the existing equipment with new data from the existing production line. Detailed calculations are available in the application. The table below includes the worse-case emission increases.

Facility-Wide Emissions
(in tons per year)

Pollutant	Uncontrolled Emissions			Controlled Emissions		
	Before Mod.	After Mod.	Emissions Change	Before Mod.	After Mod.	Emissions Change
$PM/PM_{10}/PM_{2.5}$	0.0	0.002	0.002+	0.0	0.002	0.002+
NOx	5.05	7.57	2.52+	5.05	7.57	2.52+
SO_2	0.0	0.10	0.10+	0.0	0.10	0.10+
CO	7.86	19.48	11.62+	7.86	19.48	11.62+
VOC	4.31	23.89	19.58+	4.31	23.89	19.58+
Max. Individual HAP (HCl)	2.50	7.50	5.00+	0.01	0.04	0.03+

Pollutant	Uncontrolled Emissions			Controlled Emissions		
	Before Mod.	After Mod.	Emissions Change	Before Mod.	After Mod.	Emissions Change
Total HAP	2.50	7.50	5.00+	0.01	0.04	0.03+
Total GHG (if applicable)	N/A	N/A	N/A	N/A	N/A	N/A

Regulatory Applicability

Nexus is a Synthetic Minor Source of air pollution and will continue to be so after the modification. Therefore, PSD permitting does not apply to this project.

Nexus is a Synthetic Minor Source of air pollution and will continue to be so after the modification. Therefore, NNSR permitting requirements do not apply to this project.

The NSPS for Stationary Spark Ignition (SI) Internal Combustion Engines (ICE) (40 CFR Part 60 Subpart JJJJ) applies to owners and operators of SI ICE that commence construction after June 12, 2006, where the stationary SI ICE are manufactured on or after July 1, 2008, for engines with a maximum engine power less than 500 hp. This rule applies to the IC engines IC01 and IC02 because they have a manufacture year after 2008 and have an engine power less than 500 hp (note: the estimated rated power of each engine is 469 hp based on a conversion factor of 1.34 hp per kW). The facility will maintain compliance with this rule by:

- Complying with the emissions standards of Table 1 of 40 CFR 60 Subpart JJJJ pursuant to 40 CFR 60.4233(e):

Engine Type and Fuel	Maximum Engine Power	Manufacturer Date	Emission Standards					
			g/HP-hr			ppmvd at 15% O2		
			NOx	CO	VOC	NOx	CO	VOC
Non-Emergency SI Natural Gas and Non-Emergency SI Lean Burn LPG[1]	100<HP<500	1/1/2011	1.0	2.0	0.7	82	270	60

[1] For the purposes of assessing applicability of 40 CFT 60 Subpart JJJJ, it is assumed that the non-condensable process gas burned by the IC engines is equivalent to natural gas or LPG.

- Purchasing non-certified engines and demonstrating compliance with specified emission standards (40 CFR 60.4243(b)(2)).
- Keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. Conduct an initial performance test to demonstrate compliance (40 CFR 60.4243(b)(2)(i)).
- Perform initial performance testing for NOx, CO, and VOC. Subsequent performance testing is not required unless the stationary engine undergoes rebuild, major repair or maintenance. (40 CFR 60.4243(f)).
- Conduct the performance test within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup (40 CFR 60.8(a)).

- Notification of the actual date of initial startup within 15 days after such date (40 CFR 60.7(a)(3)).

The NSPS for Stationary Compression Ignition (CI) Internal Combustion Engines (ICE) (40 CFR Part 60 Subpart IIII) applies to owners and operators of CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are:

1. Manufactured after April 1, 2006, and are not fire-pump engines, or
2. Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.

This rule applies to the emergency generator EG01 because it has a manufacture year after 2006. However, this generator is exempt from permitting according to Georgia rule 391.3-1-.03(6)(b)11(i).

The 40 CFR Part 60 Subpart Kb rule applies to each storage vessel with a capacity greater than or equal to 75 cubic meters (m^3) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984. The crude oil storage tanks (ST05 – ST12) have a storage tank capacity of 45.42 m^3 (12,000 gallons) each. The wax storage tanks (ST13 – ST16) have storage tank capacity of 64.35 m^3 (17,000 gallons) each. Therefore, the requirements of this section do not apply to crude oil or wax storage tanks.

HAP potential emissions are below the major source thresholds of 10 tons per year of individual HAP and 25 tons per year of total HAP. Therefore, major source NESHAPs and Clean Air Act Section 112(g) ["Case-by-Case MACT"] permitting does not apply.

40 CFR 63 Subpart ZZZZ (RICE NESHAP) applies to the IC engines IC01 and IC02 and the emergency generator EG01. However, the only applicable requirement is to meet any applicable provisions of NSPS IIII or NSPS JJJJ (40 CFR 63.6590(c)). No further requirements, including the initial notification and other NESHAP provisions, apply to the IC engines and emergency generator under this rule.

According to Georgia Rule 391-3-1-.02(2)(g), the following limit will apply to the facility:

- Fuel sulfur content of no more than 2.5% by weight (for fuel burning sources with maximum heat input capacity below 100 MMBtu/hr).

The facility will comply with this regulation by burning process gas and ultra-low sulfur distillate oil, which have sulfur contents below the limit.

Georgia Rule (mmm) applies to the IC engines (IC01 and IC02). This rule will be met by:

- Complying with the limit of 80 ppm NOx at 15% O_2, dry basis during the period of May 1 through September 30 of each year.
- Conduct an initial performance test for NOx to demonstrate compliance.
- Monitor NOx emissions between March 1 and May 1 of each calendar year. Perform the measurement using the manufacturer recommended settings for reduced NOx emissions. Three test measurements of 30 minutes in duration each are required.
- Following the annual NOx measurement, operate the engine using the settings determined during the annual measurement.
- Certify that no adjustments were made after each annual NOx measurement for the period from May 1 to September 30 of each year. Make this certification in writing no later than October 15 of each year.

Georgia Rule (mmm) does not apply to the emergency generator (EG01) as long as it operates less than 200 hours per year.

According to Georgia Rule 391-3-1-.02(2)(n) the facility will be required to take all reasonable precautions to prevent fugitive dust from becoming airborne and to maintain visible emissions from fugitive dust below 20% opacity.

Nexus will be required to not cause, let, suffer, permit, or allow any emissions from any manufacturing process that contain visible emissions, the opacity of which is equal to or greater than forty (40) percent to comply with to Georgia Rule 391-3-1-.02(2)(b).

The facility is not subject to Georgia Rule (yy) – Emissions of Nitrogen Oxides from Major Sources because the facility-wide potential NOx emissions do not exceed 25 tpy.

Georgia Rule (tt) applies to sources in certain counties, including Fulton County, where emissions can potentially cause or contribute to ozone non-attainment. This rule does not apply because site-wide potential emissions are less than 25 tons per year VOC.

The IC engines do not supply electricity for sale; therefore, the Acid Rain Program [40 CFR 72] does not apply.

Permit Conditions

Permit conditions discussed below is related to the proposed modification only. For a detailed discussion of permit conditions for this facility see the narrative dated March 20, 2017, associated with Application Number 24218 (Air Quality Permit Number 2869-121-0946-S-01-0 which was issued on August 4, 2017).

Condition 2.2 was added to limit the facility to less than 25 tpy VOC emissions. The facility requested this limit to avoid major source classification, rule (tt) and a PSD review.

Condition 2.3 was added to limit the facility to less than 25 tpy NOx emissions. The facility requested this limit to avoid major source classification, rule (yy) and a PSD review.

Condition 2.4 limits the visible emissions for all manufacturing process to less than 40% opacity.

Condition 2.5 limits the burning of any fuel containing more than 2.5 percent sulfur by weight. The facility will comply with this regulation by burning process gas and ultra-low sulfur distillate oil, which have sulfur contents below the limit.

Condition 2.6 was added to address 40 CFR 60, Subpart JJJJ applicability to operating engines IC01 and IC02.

Condition 2.7 was added to specify emissions limits for engines IC01 and IC02 per 40 CFR 60, Subpart JJJJ.

Condition 2.8 was added to specify emissions limits for engines IC01 and IC02 according to Rule (mmm).

Condition 2.9 requires the facility to comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 63, Subpart A, "General Provisions," and Subpart ZZZZ, "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines," for the operation of engines IC01 and IC02. However, the only applicable requirement is to meet any applicable provisions of NSPS IIII or NSPS JJJJ (40 CFR 63.6590(c)). The facility will comply with this condition by fulfilling Condition 2.7.

Condition 3.1 was modified to add the requirement to maintain visible emissions from fugitive dust below 20% according to rule 391-3-1-.02(2)(n)2.

Condition 4.2 was modified to add the two new Extruder Scrubbers (Source Code SC02 and Source Code SC03).

Condition 5.2 was modified to include the two new Extruder Scrubbers to the existing requirement to install, calibrate, maintain, and operate indicators for the scrubbers.

Condition 5.3 was modified to include the two new Extruder Scrubbers to the requirement to determine and record the operation parameters: flow rate, differential pressure, and scrubbant pH.

Condition 5.4 was modified to include a new flare FB02 to the requirement to maintain and record once per 8-hour period the presence of the pilot flame.

Condition 5.5 was added for the IC engine requirements of Georgia Rule (mmm) to monitor NOx emissions between March 1 and May of each calendar year through three test measurements of 30 minutes in duration each.

Conditions 5.6 was added for the requirements of Georgia Rule (mmm) to operate the IC engines with the settings determined after the annual NOx measurement and to certify and record no later than October 15 of each year that no adjustments were made to the engines by the Permittee or third party.

Condition 6.2 was added for the IC engines requirement to conduct initial performance testing for NOx, CO and VOC according to 40 CFR 60.4243(f) of 40 CFR 60, Subpart JJJJ.

Condition 6.3 as added to the general requirements of performance tests to be conducted within 60 days after achieving the maximum production rate but not later than 180 days after initial start up per 40 CFR 60.8(a).

Condition 7.2 was modified to add the two new Extruder Scrubbers to the report and recordkeeping requirements of the scrubber operating parameters.

Condition 7.3 was modified to add the two new Extruder Scrubbers and the new flare.

Conditions 7.5 through 7.11 are new conditions added because of the requested facility-wide HAP, NOx and VOC limits. These conditions require the facility to submit a protocol to be used to calculate monthly and 12 month rolling totals of VOC, NOx and HAP emissions.

Condition 7.12 was added to request the facility to submit a written notification of the new line startup within 15 days after such date.

Toxic Impact Assessment

A toxic impact assessment has been performed for the facility after the modification to address compliance with Georgia's Air Toxic Guidelines. The assessment was conducted using Georgia EPD's Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions. The assessment indicates that all potential air toxic emissions from the facility are below the Appendix A Minimum Emission Rates (MER). As a result, dispersion modeling was not required for this facility.

Summary & Recommendations

The facility will be a synthetic minor source of HAP emissions for HCl, for NOx and VOC due to limits established in accordance with this permit. Compliance will be demonstrated through operation of the Extruder Scrubbers (Source Codes SC01, SC02 and SC03) at all times during operation. Controlled HCl emissions are required to be less than 10 tpy. The controlled VOC and NOx emissions are required to be less than 25 tpy. NOx, HAP and VOC compliance will be demonstrated by monthly and 12 month rolling facility wide calculations.

The facility changed the name from Nexus Headquarters to Nexus Circular LLC.

A Public Notice expired December 9, 2022. No comments were received.

SSCP – Air Toxics Unit will be responsible for receiving the compliance reports from the facility. I recommend the approval of the new processes and operation of the new line through the issuance of Air Quality Permit No. 2869-121-0946-S-01-1.